with a preternatural show of flower and fruitage; but his reputation has been a growing one, and it will be a lasting one, because he also has done things which will endure.

"Crescit occulto velut arbor ævo Fama."

It has struck its roots deep in the affection and respect of Irish hearts; and it will continue to flourish there, unless we fall upon those evil days in which men lose all right to have hope from the living, because they have become careless and cold in paying honour to their illustrious dead.

The ballot for the election of a Member of Council to serve on the Committee of Antiquities having been scrutinized in the face of the Academy, the President reported that Lord Talbot de Malahide was duly elected to the place vacant on the Council.

The Secretary presented, on the part of the Rev. Robert King, a copy of the "Essay on the Primacy of Armagh" in the form in which it originally appeared as a portion of the "Armagh Guardian" newspaper.

MONDAY, FEBRUARY 26, 1866.

The Very Rev. Charles Graves, D. D., President, in the Chair.

The Rev. Samuel Haughton, M. D., Fellow of Trinity College, Dublin, read the following paper:—

On the Meteoric Stone that fell at Dundrum, County of Tipperary, on the 12th August, 1865.

The Meteoric Stone, that forms the subject of the present Paper, fell near Dundrum, county of Tipperary, under circumstances that were described to me as follows, by the man in whose garden it fell:—

STATEMENT OF EYEWITNESS.

"I, John Johnson, of the parish of Clonoulty, near Cashel, county Tipperary, was walking across my potato garden, at the back of my house, in company with Michael Fahy and William Furlong, on the 12th of August, 1865, at seven P. M., when I heard a clap, like the shot out of a cannon, very quick, and not like thunder; this was followed by a buzzing noise, which continued for about a quarter of an hour, when it came over our heads; and on looking up, we saw an object falling down in a slanting direction. We were frightened at its speed, which was so great that we could scarcely notice it; but after it fell, we proceeded to look for it, and found it at a distance of forty yards, half buried in the ground, where it had struck the top of a potato drill. We were some time in looking for it (a longer time than that during which we had heard the noise). On taking up the stone, we found it warm, milk warm, but not hot enough to be inconvenient. The next day it was given up to Lord Hawarden.

"John Johnson."

It was afterwards presented by Lord Hawarden to the Geological Museum of Trinity College, where it is publicly exhibited.

The stone weighed 4lbs. 14½ oz. It is rudely pyramidal in form; the triangular base being a freshly broken surface, and the faces of the pyramid being covered by the usual black vitrified glaze. It is evidently a portion of a much larger stone; and as it appears from the foregoing statement that its vertical velocity was not great, it is probable that other pieces of the larger mass may yet be found in the neighbourhood of Dundrum.

A singular feature is observable in this stone that I have never yet seen in any other:—the rounded edges of the pyramid are sharply marked by lines on the black crust, as perfect as if made by a ruler. This appearance is strictly confined to the surface, and seems to be a result of some peculiar tension of the fused crust in cooling; for no trace of any continuation of the lines can be found in the interior of the stone.

On examination with the lens, specks of metallic iron and of magnetic pyrites are visible, and also a few minute grains of chrysolith; no other minerals can be detected in the paste, which is of a dull grey, and of loose texture, almost like a porous sandstone; and the whole stone would attract little notice, were it not for its specific gravity, and the metallic particles visible in it. The specific gravity of this Meteoric Stone, as is usually found to be the case, varied in specimens taken from different parts of the mass. The portion analyzed was found to have the following specific gravity:—

	Grs.
Weight in air, ...	299·6
Weight in water, ...	201·9
Difference, . .	97·7 grs.

from which data the specific gravity is found to be,

$$\text{Specific gravity} = \frac{2996}{977} = 3{\cdot}066.$$

Other portions of the stone gave a specific gravity of 3·57.

From 100 grs. acted on with iodine,* which dissolved out the alloy of iron and nickel, there were obtained, of peroxide of iron, 27·95 grs., and of protoxide of nickel, 1·20.

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* This method of investigation was suggested by Mr. William Early, Assistant in the Laboratory of Trinity College; the process consists in digesting the powdered mineral in iodine with water for twelve hours, and proved to be completely successful, as was shown by comparative trials on different portions of the powdered mineral.

The portion insoluble in iodine was now acted on with dilute muriatic acid, and gave the following results :—

	Grs.	
Silica,	12·92	
Alumina,	0·15	
Peroxide of iron,	9·87	present originally as protoxide and protosulphuret of iron.
Carbonate of lime,	0·50	
Pyrophosphate of magnesia,	38·00	
Potash and soda chlorides,	0·45	
Platino-chloride of potassium,	0·42	
Oxide of manganese (Mn_3O_4),	0·05	

On treating another 100 grs. of the stone for sulphur, with muriatic acid, and conducting the sulphuretted hydrogen into ammoniacal solution of sulphate of copper, so as to form a black precipitate of sulphuret of copper, there were found by the usual methods 10·7 grs. of sulphate of barytes.

There were left, after the treatment with iodine and dilute muriatic acid, 42·1 grs. of mineral, insoluble in these reagents.

From the solution by iodine, and the determination of sulphur, as sulphate of barytes, we obtain—

	Grs.	Grs.
Peroxide of iron,	27·95	19·57 iron.
Protoxide of nickel,	1·20	0·94 nickel.
Sulphate of barytes,	10·70	4·05 protosulphuret of iron.

Hence we obtain, as our primary analysis of the Dundrum Meteoric Stone—

I.—*Primary Analysis of Meteorite* (A.).

1. Metallic iron,	19·57
2. Metallic nickel,	0·94
3. Magnetic pyrites,	4·05
4. Mineral soluble in dilute muriatic acid,	33·34
5. Mineral insoluble,	42·10
	100·00

The analysis of the earthy mineral soluble in dilute muriatic acid gives us (considering that 4·05 of FeS is equivalent to 3·68 of Fe_2O_3) the following result.

II. *Soluble Mineral* (A).

	Grs.	Per Cent.	Oxygen.
1. Silica,	12·92	38·74	20·112
2. Alumina,	0·15	0·45	0·209
3. Protoxide of iron,	5·51	16·55	3·671
4. Protoxide of manganese,	0·05	0·15	0·033
5. Lime,	0·28	0·84	0·340
6. Magnesia,	13·65	40·93	16·358
7. Potash,	0·08	0·24	0·039
8. Soda,	0·17	0·51	0·130
9. Loss,	0·53	1·59	
	33·34	100·00	40·892

Adding together the oxygen of the protoxides, we find—

$$\left.\begin{array}{l} RO = 20{\cdot}571 \\ SiO_3 = 20{\cdot}112 \\ Al_2O_3 = \ 0{\cdot}209 \end{array}\right\} = 20{\cdot}321$$

This result identifies the soluble mineral with Chrysolith (or Olivine), unless it be supposed to be a mixture of several minerals. Neglecting all the lesser constituents, we have

		Oxygen.
SiO_3, . .	20·1	
FeO, . .	3·671	20·039
MgO, . .	16·358	

which gives very well the formula of Chrysolith,

$$3RO, SiO_3.$$

The preceding analysis of the soluble portion of the Meteorite was checked by the following proceeding:—The 100 grs., from which the sulphur was determined, having been acted on by the muriatic acid, the acid solution was evaporated to dryness, and filtered; and the portion left on the filter was boiled with solution of carbonate of soda, so as to redissolve the silica soluble in muriatic acid. There were left 42·44 grs. of insoluble mineral, while the soluble portion gave

	Grs.	
Silica, ...	12·36	
Peroxide of iron, ...	38·60	Present originally as iron, protoxide of iron, and protosulphuret of iron.
Oxide of nickel, ...	1·44	
Carbonate of lime, ...	0·40	
Pyrophosphate of magnesia, .	32·62	
Potash and soda chlorides, .	0·40	

Assuming the iron (metallic) as 19·57, and the protosulphuret of iron as 4·05, we find

Equivalent of 19·57	Fe, ...	27·94	Fe_2O_3
„ 4·05	FeS, ...	3·68	„ „
		31·62	

Subtracting this result from the total peroxide of iron, and converting the oxide of nickel into nickel, we obtain

I. *Primary Analysis of Meteorite* (B).

1. Metallic iron, ...	19·57
2. Metallic nickel, ...	1·13
3. Magnetic pyrites, ...	4·05
4. Mineral soluble, ...	32·81
5. Mineral insoluble, ...	42·44
	100·00

II. *Soluble Mineral* (B).

	Grs.		Oxygen.	
1. Silica,	12·36	38·86	20·175	
2. Protoxide of iron,	6·28	19·74	4·379	
3. Lime,	0·23	0·72	0·204	
4. Magnesia,	11·72	36·85	14·727	= 19·465
5. Potash,	0·07	0·22	0·036	
6. Soda,	0·15	0·47	0·119	
7. Loss,	1·00	3·14		
	31·81 grs.	100·00		

This result completely verifies that already found, and proves the soluble mineral of the Meteorite to be Chrysolith, having the formula

$$3RO, SiO_3,$$

in which RO denotes protoxide of iron and magnesia.

The 42·10 grs. of mineral insoluble in muriatic acid were divided into equal parts, of which one was fluxed with carbonate of soda, and the other with lime and chloride of ammonium, with the following results:—

	Grs.
Silica,	12·45
Alumina,	0·35
Peroxide of iron,	1·64
Oxide of manganese (Mn_3O_4),	0·16
Peroxide of chrome (Cr_2O_3),	0·51
Carbonate of lime,	1·45
Pyrophosphate of magnesia,	12·45
Potash and soda chlorides,	0·80
Platino-chloride of potassium,	0·90

Assuming the chromium to be present as chrome-iron, and making the necessary reductions in the other elements, we find

	Grs.
Original weight,	21·05
Chrome-iron,	0·75
Insoluble mineral,	20·30 grs.

III. *Insoluble Mineral.*

	Grs.		Oxygen.	
Silica,	12·45	61·33	31·842	
Alumina,	0·35	1·72	0·803	
Protoxide of iron,	1·23	6·06	1·344	
Protoxide of manganese,	0·16	0·78	0·174	
Lime,	0·81	3·99	1·133	11·943
Magnesia,	4·47	22·02	8·800	
Soda,	0·28	1·38	0·352	
Potash,	0·17	0·83	0·140	
Loss,	0·38	1·89		
	20·30 grs.	100·00		

It is not possible to form any opinion as to the mineral composition of the insoluble portion of the Meteorite, as it is doubtless composed of more than one unknown mineral substance.

If we collect into one view the preceding results, taking a mean of all, we obtain the following mineralogical composition for the Dundrum Meteorite :—

IV. *Mineralogical Composition of Dundrum Meteorite.*

1. Nickel-iron, ...	20·60	Iron, . . 19·57 Nickel, . 1·03
2. Protosulphuret of iron, . . .	4·05	
3. Chrome-iron, ...	1·50	
4. Mineral soluble in muriatic acid, probably chrysolith,	33·08	
5. Minerals insoluble in muriatic acid, ...	40·77	
	100·00	

ON THE SHOWER OF AËROLITHS THAT FELL AT KILLETER, COUNTY OF TYRONE, ON THE 29TH OF APRIL, 1844.

On the 29th of April, 1844, a shower of Meteoric Stones fell, in the sight of several people, at Killeter, near Castlederg, county of Tyrone: they broke into small fragments by the fall, one piece only being found entire; it was (according to the testimony of a resident) "about as large as a joint of a little finger." The stones were hot when found. The account given by three gentlemen, who, however, did not actually see the shower fall, was that they were at a distance of three or four miles, up the hills in the neighbourhood; it was a fine sunny afternoon (three or four o'clock); they heard "music" towards Killeter, which they supposed to proceed from a strolling German band which they knew to be in the neighbourhood; they are under the impression that they heard the music several times in the course of the evening; they remember also to have noticed clouds in the direction of Killeter. On reaching Killeter, the same evening, they were told of the wonderful shower of stones which had spread over several fields. I received the fragments of these stones from the Rev. Dr. M'Ivor, Ex-Fellow of Trinity College, Dublin, and Rector of Ardstraw: he writes to me that "it is now very difficult to get either a specimen of a stone, or any very distinct intelligence of them: even the very rumour of them has nearly died out, and you might ask intelligent middle-aged men about the neighbourhood who had never heard them mentioned." He adds that the people of that locality are very "uncurious," and that if there were a veritable burning bush thereabouts, few would "turn aside to see."

The largest specimen given to me by Dr. M'Ivor weighed 22·23 grs. in air, and 16·32 grs. in water, showing that its specific gravity is 3·761. Both it and the smaller fragments presented the usual black

crust and internal greyish-white crystalline structure and appearance, with specks of metallic lustre, occasioned by the iron and nickel alloy that was present. I analyzed it in the usual manner; but, owing to an accident, I was unable to determine the composition of the earthy portion soluble in muriatic acid.

The following is the mineralogical composition of these Aëroliths :—

1. Hornblendic mineral (insoluble in acid), . .	34·18
2. Earthy mineral (soluble in acid), ...	30·42
3. Iron, ...	25·14
4. Nickel, ...	1·42
5. Sesquioxide of chrome, ...	2·70
6. Cobalt, ...	trace
7. Magnetic pyrites, ...	6·14
	100·00

The earthy portion, insoluble in muriatic acid, had the following composition :—

		Atoms.	
Silica, . . .	55·01	1·22	
Alumina, . .	5·35	0·10	
Protoxide of iron,	12·18	0·34	1·66
Lime, . . .	3·41	0·12	
Magnesia, . .	24 03	1·20	
	99·98		

Omitting the alumina, the preceding analysis gives the rational formula of the hornblende family,

$$4\,RO,\ 3\,SiO^3,$$

and, taken as a whole, it agrees with the analysis of many hornblendes. The variety of hornblende with which it has the closest relation is anthophyllite.

According to Mr. Gregg's "Catalogue of Meteoric Stones and Irons," three other falls of Aëroliths are recorded as having occurred in Ireland :—

1. A. D. 1779, at Pettiswood, Westmeath; 6 oz.
2. August, 1810, Mooresfort, county of Tipperary; 7¾ lbs. Spec. grav. = 3·670.
3. September 10, 1813, Adare, county of Limerick; 17 lbs. + 65 lbs + 24 lbs.; moving E. to W. Spec. grav. = 3·64.
4. April 29, 1844, Killeter, county of Tyrone; fragments of one stone. Spec. grav. = 3·761.

Of the Meteorite that fell at Mooresfort, county of Tipperary, in 1810, the only analysis on record is one published by the late Professor Higgins, in the forty-seventh volume of the "Proceedings of the Royal Dublin Society," in whose Museum the greater part of this stone, and a cast of the entire, are carefully preserved.

Professor Higgins considered 35 per cent. of the stone to consist of metallic particles separable by the magnet. This would include the

magnetic pyrites, iron, nickel, and chrome. In the Tyrone Meteorite examined by me, the iron, nickel, chrome oxide, and magnetic pyrites amounted to 35·40 per cent., which is very nearly the same proportion.

Dr. Apjohn has published a detailed account of his analysis of the Adare Meteorite in the eighteenth volume of the "Transactions of the Royal Irish Academy," from which it appears that the following is the mineralogical composition of that Meteorite:—

1. Meteoric iron and nickel, . .	23·07
2. Magnetic pyrites, ...	4·38
3. Chrome iron, ...	3·34
4. Earthy matrix, ...	68·47
5. Alkalies and loss, ...	0·74
	100·00

Its specific gravity varied from 3·621 to 4·230. The composition of the matrix of 200 grs. was found to be—

	Grs.
Silica, ...	78·19
Magnesia, ...	43·13
Protoxide of iron, ...	15·62
	136·94

George V. Du Noyer, M. R. I. A., F. R. G. S. I., Senior Geologist, Geological Survey of Ireland, presented to the Library of the Royal Irish Academy 100 Drawings from Original Sketches of Architectural Antiquities, to form Vol. VII. of a series of similar donations.

Mr. W. M. Hennessy read the following paper:—

The Curragh of Kildare.

It must be admitted that our most authentic and ancient extant records contain little or no reference to the *original* establishment of the Curragh of Kildare as a theatre, or common, for the celebration of national games, sports, and pastimes; and no allusion whatever to its having been allocated, at any period, to the performance of the mystic rites of the Druidical religion. The presumption that it was ever devoted, either in whole or in part, to the latter purpose, rests on very slight evidence, as we shall see; but that it was allocated to the former practice—nay, has continued to be so for the space of at least 2000 years—is very certain. The obscurity which surrounds the origin of all monuments belonging to the pre-historic period necessarily attaches to the ancient history of the Curragh. We know at least as much regarding it as the English know respecting the monuments of Stanton Drew and Stonehenge—the latter of which is asserted by some of the early English Chroniclers to have been transferred thither from the "plains" of Kildare. But of its use, the race

DUNDRUM METEORITE.

End View of the DUNDRUM-METEORITE (12th August, 1865), showing the straight lines of the Crust, along the edges of Pyramid.